

# Algebra Review:

Variable:

Equation:

$$a_x$$

$$\Delta x = v_{ix}t + \frac{1}{2}a_xt^2$$

$$m_1$$

$$m_1v_{1i} + m_2v_{2i} = (m_1 + m_2)v_f$$

$$r$$

$$F = \frac{kq_1q_2}{r^2}$$

$$R_1$$

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$$


$$\Delta x = v_{ix}t + \frac{1}{2} \underline{a_x} t^2 \quad \text{for } a_x$$

$$\left(\frac{1}{\frac{1}{2}t^2}\right) \Delta x - v_{ix}t = \frac{1}{2} a_x t^2 \left(\frac{1}{\frac{1}{2}t^2}\right)$$

$$\frac{2}{t^2} (\Delta x - v_{ix}t) = a_x$$

$$\frac{2(\Delta x - v_{ix}t)}{t^2} = a_x$$

$$\text{for } m_1 \quad m_1 v_{1i} + m_2 v_{2i} = (m_1 + m_2) v_f$$

$$m_1 v_{1i} + \underline{m_2 v_{2i}} = m_1 v_f + m_2 v_f$$


$$m_1 v_{1i} - m_1 v_f = m_2 v_f - m_2 v_{2i}$$

$$m_1 (v_{1i} - v_f) = m_2 v_f - m_2 v_{2i}$$

$$m_1 = \frac{m_2 v_f - m_2 v_{2i}}{v_{1i} - v_f}$$

$$\text{for } r \left( \frac{r^2}{F} \right) F = \frac{kq_1q_2}{r^2} \left( \frac{r^2}{F} \right)$$

$$\sqrt{r^2} = \frac{\sqrt{kq_1q_2}}{\sqrt{F}}$$

$$r = \sqrt{\frac{kq_1q_2}{F}}$$

$$\text{for } R_1 \quad \frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$(R_1) \frac{1}{R_{eq}} - \frac{1}{R_2} = \frac{1}{\cancel{R_1}} (R_1)$$

$$R_1 \left( \frac{1}{R_{eq}} - \frac{1}{R_2} \right) = 1$$

$$R_1 = \frac{1}{\frac{1}{R_{eq}} - \frac{1}{R_2}}$$

$$= \left[ \frac{1}{R_{eq}} - \frac{1}{R_2} \right]^{-1}$$

Science → what is the point?

- to know why things happen
- explain why stuff works
- understand the world
- to disprove things
- teaches people how to solve problems
- make things better
- to be an "educated" person
- to answer the unknown

Observation:

- something you notice about an object

Inference:

- drawing a conclusion based on evidence

$$\text{for } m \quad Fd = \left( \frac{1}{2} m v_f^2 - \frac{1}{2} m v_i^2 \right) + \Delta U_g$$

$$Fd = m \left( \frac{1}{2} v_f^2 - \frac{1}{2} v_i^2 \right) + \Delta U_g$$

$$Fd - \Delta U_g = m \left( \frac{1}{2} v_f^2 - \frac{1}{2} v_i^2 \right)$$

$$m = \frac{Fd - \Delta U_g}{\frac{1}{2} v_f^2 - \frac{1}{2} v_i^2}$$